IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellant: Lester F. LUDWIG
 	
Serial No.: 10/676,926
 	
Filed: September 30, 2003
 	
Title: Derivation of Control Signals from Real-time Overtone Measurements
 	
Group Art Unit: 2837
 	
Examiner: Marlon T. Fletcher
 	
Confirmation No. 8187
 	
Attorney Docket No.: [92031-8727] 2152-3014
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	October 8, 2008 /Jeffrey J. Lotspeich/
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REPLY BRIEF

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

Pursuant to 37 CFR § 41.41, this brief is responsive to the Examiner's Answer of August 8, 2008. The filing of this brief is believed timely since it is being filed within the non-extendable two-month time limit set out in 37 CFR § 41.41(a)(1). Accordingly, Appellant submits the following:

1. Overview

Appellant has carefully reviewed the various points set forth in the Examiner's Answer and has formulated the following observations.

- Pitched signal generator 102 produces pitched signal 140 as an audio signal, not as a control signal as alleged by the Examiner. Moreover, the Examiner's reference to "filtering of pitch" does not make technological sense since pitch is not filtered.

- The Examiner contends that filtered tone 131 has amplitude envelope 126 applied to it (tone 131) by multiplier 209. However, the Examiner's comments are irrelevant since this is not what is required by claim 1, which recites "provides amplitude measurement of said isolated overtone signal." Lindemann is applying an amplitude envelope to tone 31, but does not teach or suggest providing an amplitude measurement of tone 31.

- Appellant's position is that Lindemann never describes envelope builder 125 or generator 111 as providing "amplitude measurement." To the contrary, envelope builder 125 is described as generating an amplitude envelope, which has nothing to do with an "amplitude measurement."

- The Abstract does not clearly disclose the filtering of pitch, as alleged by the Examiner. Instead, the Abstract discloses interpolations over pitch. Performing interpolations over pitch (Abstract) is wholly unrelated to filtering of pitch.

- Despite Appellant's best efforts and continued requests, the Examiner again fails to provide any supporting description for the rejection to at least 74 claims.

Accordingly, Appellant submits that there remains a number of clear errors in the Examiner's rejections for which Appellant seeks review by the Board. Appellant will now address the various points raised by the Examiner.

2.   Related appeals and interferences

The Examiner listed a number of appeals that are related to the present appeal. However, Appellant has recently updated this portion of the Appeal Brief by virtue of the Supplemental Appeal Brief filed on September 8, 2008. For the convenience of the Board, presented below is an accurate and complete list of appeals which are related to the present appeal. Each of these appeals has the same examiner as the present appeal.

Docket No.	App. Ser. No.:	App. filing date:	Appeal filed:
2152-3005	09/812,400	March 19, 2001	January 25, 2007
2152-3023	10/680,591	October 6, 2003	January 31, 2008
2152-3027	10/702,262	November 5, 2003	January 29, 2007 March 12, 2008
2152-3026	10/703,023	November 5, 2003	July 25, 2006
2152-3030	10/702,415	November 6, 2003	August 8, 2008
2152-3044	11/040,163	January 21, 2005	January 31, 2008

3.   Appellant's position-- Lindemann discloses audio, not a control signal
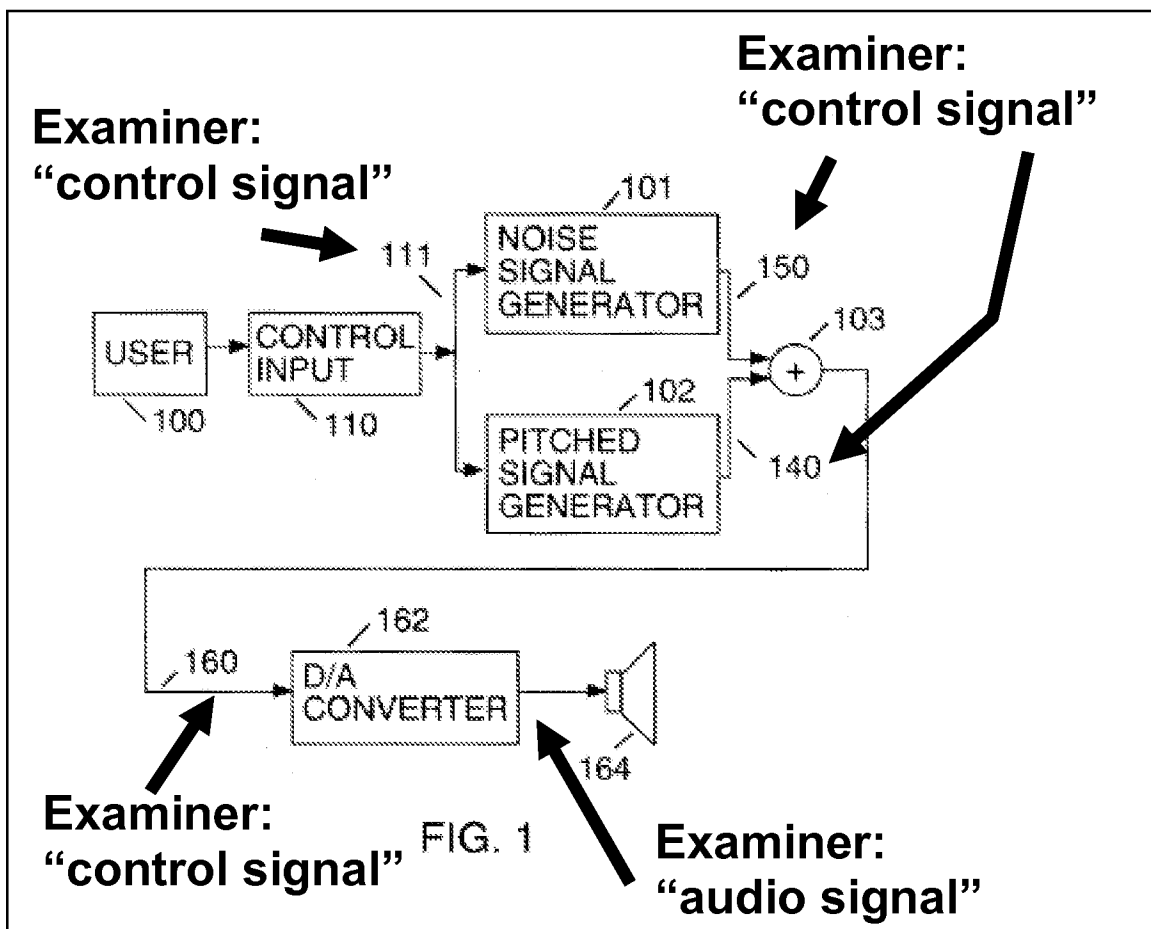
Claims 1-3, 12, 13, 17-19, 25-44, 46, 53, 54, 58-60, 66-88, and 90-96 stand rejected under 35 U.S.C. §102(b) as being anticipated by Lindemann et al. (U.S. 5,744,742).

Claim 1 is directed toward a system for control signal generation and recites "a parameter signal processing unit . . . generating an outgoing control signal based upon said isolated overtone parameter signal."

The point at issue is whether pitched signal 140 of Lindemann teaches the claimed "control signal." The Examiner attempts to clarify his position by specifically identifying assorted signals of Lindemann that disclose a "control signal." (Examiner's Answer, pg. 7). In particular, the Examiner alleges that a "control signal" is taught by each of the following:

- control signal 111

- noise signal 150

- pitched signal 140

- <u>audio</u> output 160.

The Examiner also contends that the signal provided by D/A converter 162 is an audio signal. For the convenience of the Board, Appellant provides below Fig. 1 of Lindeman which has been annotated in accordance with the position set forth by the Examiner.

FIG. 1

Recall that pitched signal generator 102 (Fig. 1) is shown in more detail in Fig. 3 of Lindemann. The point of contention can be distilled down to whether pitch signal 140, which is provided by pitched signal generator 102, teaches the claimed "control signal."

Appellant will first address the Examiner's comments as to the assorted control

signals purportedly provided by Lindemann. First, Appellant does not disagree with the Examiner that control signal 111 is a control signal. However, with regard to signals 140, 150, and 160, Appellant submits that the Examiner's contention that these signals are "control signals' goes against the explicit teachings of Lindemann.

Noise signal 150

Regarding noise signal 150, this signal is produced by noise signal generator 101, which is shown in more detail in Fig. 4. The various components of pitch signal generator 101 shown in Fig. 4 clearly relate to audio signal generation and filtering, and are used to produce an audio signal, which in this particular case is a noise signal 150. (Lindemann col. 22, lines 24-56). Appellant emphasizes that noise signal 150 relates to noise, and it is this noise that is an audio signal. The Examiner's contention that an audio noise signal is a control signal is clearly misplaced.

Audio output 160

Regarding audio output 160, the name of this signal speaks for itself—it is audio. For the Examiner to allege that audio output 160 is a control signal completely misstates the teachings of the Lindemann patent. (Lindemann col. 6, lines 16-22). Appellant has thoroughly reviewed Lindemann and is unable to identify any support for the Examiner position. Indeed, the Examiner merely sets forth this allegation without identifying any support in Lindemann for such comments.

Further on the audio output 160 feature, the Examiner also alleges that this signal is a control signal until it is converted to an analog signal by D/A converter 162, and that this analog signal driving speaker 164 is an audio signal. (Examiner's Answer pg. 7). Appellant submits that the Examiner's characterization regarding the D/A converter is misplaced. By all established conventions, the signal applied to the input of a D/A converter is a digital version of the same signal that appears as an analog version at the output of the D/A converter:

- If the signal is a control signal, it is a digital control signal converted to an analog control signal by the D/A converter.
- If the signal is a video signal, it is a digital video signal converted to

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an analog video signal by the D/A converter.

- If the signal is a audio signal, it is a digital audio signal converted to an analog audio signal by the D/A converter.

- If the signal is a radio-frequency signal, it is a digital radio-frequency signal converted to an analog radio-frequency signal by the D/A converter.

That is, the D/A converter does not change a control signal into an audio signal. It instead changes a digital version of a signal into an analog version of that very signal.

Should further understanding of how a D/A converter operates be warranted, Appellant respectfully invites the Board's attention to Endoh et al. US 4,270,177, issued May 26, 1981, and in particular to column 4 lines 25-28, which reads "This address signal is applied to a digital-to-analog (D/A) converter 21, which produces an analog signal X corresponding to a digital input signal." Endoh further describes (column 1 lines 8-48) using analog and digital forms of both audio and control signals. Conversions between digital and analog do not change control signals to audio signals or visa versa – audio signals remain audio signals be they analog or digital, and control signals remain control signals be they analog or digital. The Examiner's position that a control signal is converted into an audio signal by D/A converter 162 is clearly inaccurate.

Appellant also notes for the Board that comments relating to a D/A converter were also submitted in an Appeal Brief in a related application of this Appellant. The related application is Ser. No. 10/680,591, is currently under appeal, and has the same Examiner as the present application. On page 17 of the Appeal Brief in the '591 application, Appellant noted that the cited reference Ishigaki et al. (U.S. 6,271,455) disclosed that decoded audio data is converted into an analog audio signal by a D/A converter. However, it was Appellant's position that the MPEG audio data is not an audio signal because this data is later converted into an audio signal.

Appellant submits that the position taken in the present application is not inconsistent with the position taken in the '591 application. The reason is that the D/A converters in the two cited references operate in entirely different contexts and do not refer to the same type of device or component. In Ishigaki, the D/A converter relates to converting a digital file into an analog signal. For example, in Ishigaki, the digital files are

not real time signals, and thus, the A/D converter also involves restoration of a temporal signal from the file data. In contrast, the D/A converter of Lindemann relates to converting a real time digital signal to a real time analog signal. Simply put, the D/A converters of Ishigaki and Lindemann relate to entirely different devices. Appellant's comments relating to these components are commensurate with the context of how these devices function in their respective references.

Pitched signal 140

This now brings us to pitched signal 140, which is the meat of the rejection since it is this signal that the Examiner's contends teaches the claimed "control signal." Pitched signal 140 is produced by pitched signal generator 102, which is shown in more detail in Fig. 3. Fig. 3 clearly includes audio signal generation and filtering elements which produce pitched signal 140 as an <u>audio</u> signal. (Lindemann col. 6, line 62 – col. 7 line 43; col. 8 line 36 – col. 10 line 25). Assorted excerpts from col. 6, lines 27-37 Lindemann are as follows:

- "The pitched part 140 contains only components which are multiples of the fundamental, possibly time-varying, pitch. Many realistic musical <u>sounds</u> can be modeled with only a pitched part. Examples are a clear trumpet <u>sound</u>, and often the low notes of a <u>piano</u>." (Emphasis added).

- "Without this knock, the pitched part 140 alone of the high pitch piano note <u>sounds</u> thin and electronic. Some tones are moderately enharmonic. They can often be viewed as <u>pitched tones</u> with out-of-tune harmonics. Piano <u>tones</u>, especially low pitched tones, exhibit this behavior." (Emphasis added).

The forgoing portions of Lindemann clearly relate to audio signals. For instance, Lindemann refers to "musical <u>sounds</u>" that can be modeled with the pitch part 140. Piano and trumpet sounds are also specifically mentioned.

As an additional point, Appellant will demonstrate that Lindemann supports Appellant's position and is completely inconsistent with the Examiner's position. In particular, Lindemann further provides the following passage:

- "Audio output 160 of this musical tone is the sum 103 of two components: a pitched part 140 generated by pitched signal generator 102, and a noise part 150 generated by noise signal generator 101." (Lindemann col. 6, col. 16-19).

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Appellant has established above that audio output 160 is an audio signal. According to Lindemann, audio output 160 is the sum of two components: pitched part 140 and noise part 150. Appellant's position is that pitched part 140 and noise part 150 are <u>audio</u> signals. As such, when these audio signals are combined (via sum 103) they form another audio signal: audio output 160. Appellant's position is therefore consistent with the Lindemann reference.

Consider now the Examiner's position, which is that pitched part 140 and noise part 150 are control signals. When these control signals are combined by sum 103, such an output would therefore result in a <u>control</u> signal. This would mean that audio output 160 is a control signal. However, this is not the case since according to Lindemann, audio output 160 is an <u>audio</u> signal, not an <u>control</u> signal. Accordingly, Lindemann provides no support for the Examiner's position.

4. Additional comments by the Examiner

The Examiner makes several comments in the Examiner's Answer for which the Appellant will briefly address.
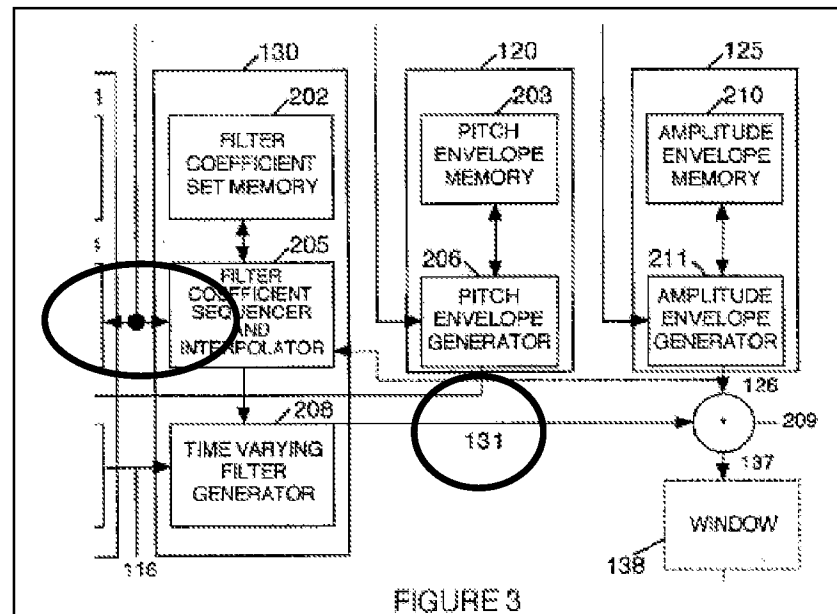
The Examiner first contents that: "The appellant argues that Lindemann fails to disclose a control signal." (Examiner's Answer pg. 6). This misstates Appellant's position. Appellant does not argue that Lindemann does not teach a control signal, but rather that audio signals 140, 160 do not teach the claimed "control signal"

The Examiner also remarked: "The appellant did not create control signals nor audio signals. Both are well known features in the art." (Examiner's Answer pg. 8). The relevance of such comments is unknown since Appellant has never taken such a position.

The Examiner also commented: "The purpose of a control signal is to control audio output or the audible sound." This can be true, but it certainly does not support the Examiner's position.

5.   Envelope builder 125 does not provide amplitude measurement

Claim 1 also requires a "bandpass filter adapted to . . . produce an <u>isolated overtone</u> <u>signal</u>," and that the "signal parameter measurement element . . . provides amplitude measurement of said <u>isolated overtone signal</u>." Provided below is the relevant portion of Fig. 3 of Lindemann.

FIGURE 3

  Appellant's position set out in the Appeal Brief is that envelope builder 125 (signal parameter measurement element) never provides amplitude <u>measurement</u> of the so-called isolated overtone signal (signal 131) as alleged by the Examiner. The reason is simple; the output of generator 130 (i.e., the isolated overtone signal) is never presented or otherwise provided to envelope builder 125 in order for the envelope builder 125 to provide the required amplitude <u>measurement</u> of this signal. Fig. 3 of Lindemann is unmistakably clear on this point.

  In the Examiner's Answer, the Examiner paraphrases Lindemann column 6 line 64 through column 7 line 9, by stating "Amplitude envelope builder (125) modifies the intermediate tone signal (131)" . . ."Filtered tone (131) has amplitude envelope applied to it." (Examiner's Answer pg. 8). From this, Examiner immediately concludes "Therefore, envelope builder (125) does provide amplitude measurement when applied to filtered signal (131)."

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The distinction here relates to the difference between the phrases "amplitude envelope applied" (Lindemann) and "provides amplitude measurement" (Claim 1). The Examiner contends that filtered tone 131 has amplitude envelope 126 applied to it (tone 131) by multiplier 209. Appellant does not disagree with the Examiner on this point since applying of an amplitude envelope is clearly shown in Fig. 3 and discussed at col. 7, lines 39-40. However, the Examiner's comments are irrelevant since this is not what is required by claim 1, which recites "provides amplitude measurement of said isolated overtone signal." Lindemann is applying an amplitude envelope to tone 31, but does not teach or suggest providing an amplitude measurement of tone 31. This point alone renders claim 1 distinguishable over Lindemann.

6. **No amplitude measurement.**

Recall that claim 1 requires a "signal parameter measurement element provides amplitude measurement of said isolated overtone signal resulting in an isolated overtone parameter signal." Recall further that the Examiner indicates that envelope builder 125 and included amplitude envelope generator 111 teach this claim element.

Appellant's position is that Lindemann never describes envelope builder 125 or generator 111 as providing "amplitude measurement." To the contrary, envelope builder 125 is described as generating an amplitude envelope, which has nothing to do with an "amplitude measurement."

The Examiner contends in the Examiner's Answer that "amplitude measurement" is taught by performing an analysis of the amplitude. (Examiner's Answer pg. 9). The Examiner now relies upon the flowchart of Fig. 9 to support the rejection.

Appellant's review of Lindemann and Fig. 9 finds the following passage:

> "FIG. 9 shows how amplitude envelope generator 211 interpolates between amplitude envelopes stored in memory 210, based only upon input pitch, to get a new decimated amplitude envelope." (Lindemann col. 20, lines 60-63) (Emphasis added).

Several points can be made with regard to the forgoing description of Fig. 9. First, the interpolation that is occurring relates to amplitude envelopes that are stored in memory 210. Appellant assumes *arguendo* that such action relates to an "amplitude measurement."

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Even if this were correct, claim 1 remains distinguishable since this amplitude measurement relates to envelopes stored in memory, and has nothing to do with an "isolated overtone signal" as required in claim 1. An amplitude envelope stored in memory is not the same thing as an "amplitude measurement of said isolated overtone signal."

A second point is that Lindemann specifically states that the Fig. 9 operations are "based only upon input pitch." Thus, Fig. 9 of Lindemann is not "performing an analysis of the amplitude" as the Examiner alleges. Pitch and amplitude are clearly not the same thing.

As a further point, Appellant has also reviewed the newly cited portions of Lindemann (Col. 19 line 63 – col. 21, line 2) and fails to find the significance of these portions as it relates to the claimed subject matter. In particular, the cited portions of Lindemann describe interpolation as being used to bridge between memory-stored envelopes that are associated with audio samples of different pitches. Nothing in this interpolation algorithm, nor its application, nor its isolated literal reading, is even suggestive of a measurement. The interpolation taught is merely a calculation of a weighted sum of two separate stored envelopes, with the relative weighting determined by a mixing coefficient "C" that is calculated from provided input pitch values and stored pitch values corresponding to the two stored enveloped (Lindemann Fig. 9, element 544). No amplitude measurement is used, taught, or implied.

7.   No fundamental frequency component or overtone component

Claim 1 also recites an "incoming electronic signal comprising a fundamental frequency component and at least one overtone component of a higher frequency than said fundamental frequency component."

Regarding the foregoing claim element, the Examiner now alleges: "The appellant does not know what points he wants to argue." This is true. Appellant does not know what points to argue. This is not because Appellant is confused about what position to take or how to characterize the Lindeman patent, but rather it is because the Examiner has failed to provide adequate support in the rejection for which Appellant can address. The Examiner simply parrots the claim language and indicates that it is taught by a particular figure of Lindemann.

It is significant that the Examiner fails to identify which signals of Fig. 3 purportedly provide the requisite teaching of the claimed "incoming electronic signal." Appellant does not know what point to argue since the Examiner has yet to establish a specific position for which Appellant can address. The whole point of Appellant's comments set out on pages 27-29 of the Appeal Brief is that the Examiner has failed to sufficiently identify the particular portion of Lindemann that are relied upon to support the rejection (i.e., which signals teach the claimed "incoming electronic signal" and where is the "fundamental frequency component and at least one overtone component" taught).

The Examiner also contends that Appellant has agreed that formant filter generator 130 teaches a "bandpass filter." This is incorrect. In the Appeal Brief, Appellant assumed, for the sake of argument, that filter 130 teaches a bandpass filter. This assumption was made only for the sake of argument, and to facilitate discussion of the Lindeman patent. Appellant makes no admission as alleged by the Examiner. Appellant believes that the Examiner does not fully understand the term "*arguendo*," which was a term used by Appellant in making the forgoing assumption. This term means that one does not admit anything, but is simply making a legal argument.

The Examiner then states "The overtone relate to the frequency and pitch. The abstract clearly discloses the filtering of pitch and tone modeling." (Examiner's Answer pg. 9). Appellant disagrees. Provided below is the Abstract of Lindemann.

> "A parametric signal modeling musical tone synthesizer utilizes a multidimensional filter coefficient space consisting of <u>many sets of filter coefficients</u> to model an instrument. <u>These sets are smoothly interpolated over pitch</u>, intensity, and time. The filter excitation for a particular note is derived from a collection of single period excitations, which form a multidimensional excitation space, <u>which is also smoothly interpolated over pitch</u>, intensity and time." (emphasis added)

The Abstract does not clearly disclose the <u>filtering of pitch</u>, as alleged by the Examiner. Instead, the Abstract discloses <u>interpolations over pitch</u>. Performing <u>interpolations</u> over pitch (Abstract) is wholly unrelated to <u>filtering</u> of pitch. Further, the Examiner's reference to "filtering of pitch" does not make technological sense. "Filtering of pitch" is not a phrase that has an accepted meaning in engineering since pitch is not filtered.

The Examiner continues by stating: "Clearly element 130 filters and isolates the overtones to provide an isolated overtone signal from the incoming signal." It is not clear which of two possible meanings the Examiner intends, but each is incorrect:

- On the one hand, should the Examiner be interpreting "isolated" as modifying a "signal" rather than modifying "overtone," this is not what is being claimed.

- On the other hand, should the Examiner correctly be interpreting "isolated" as modifying "overtone" rather than modifying "signal," then the Examiner is incorrect in the stated position that "Clearly element 130 filters and isolates the overtones…" Nowhere is this taught in Lindemann.

It is further noted that an isolated overtone is by definition a sine wave. Lindemann specifically goes to great lengths to create signals with complex time-varying timbres – see for example column 12, lines 36-39 – and in particular using filters to accomplish this. Using the Lindemann filter to isolate an overtone will only produce a sine wave, and in order to do this for any fixed pitch the filter cannot be time-varying, making all of element 205 and the time-varying feature of filter 208 unnecessary. This is not an operating mode of the Lindemann system.

8. Additional points made by the Examiner

The Examiner makes several further comments on page 9 of the Examiner's Answer for which Appellant will briefly address.

The Examiner commented that no interview was requested. No such interview requested since it is believed that such an interview would not advance prosecution of the application.

The Examiner further remarked: "The appellant's style of prosecution is to make no amendments to the claims and argue the rejections. After the final rejection, appeal is filed." The Examiner's characterization portrays Appellant as a recalcitrant inventor, which is untrue. Quickly seeking appeal was a procedure recommended by the Examiner's SPE, Lincoln Donovan. Appellant also does not understand the basis of the Examiner's comment that claim amendments are not made. A brief check of various related applications of Appellant finds that claim amendments have indeed been made on quite a

number of occasions. See, for example, the file history of Ser. No. 09/812,400 (under appeal).

9. Office Action and Examiner's Answer is silent on at least 74 claims

Claims 1-3, 12, 13, 17-19, 25-44, 46, 53, 54, 58-60, 66-88, and 90-96 stand rejected under 35 U.S.C. §102(b) as being anticipated by Lindemann et al. (U.S. 5,744,742). Claims 4-11, 20-24, 45, 47-52, and 61-65 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Lindemann in view of Pattie (5,343,793) and Frick et al. (4,265,157).

Appellant's Appeal Brief noted that the Examiner has failed to set out support for the rejections to the following 74 claims:

- 7-11, 12, 13, 17-19, 22-41, 46, 48-52, 53, 54, 58-65, 66-82, 86-88, and 90-96.

Such action violates requirements of MPEP § 707, citing 37 CFR § 1.104(c)(2), which provides:

> "... When a reference is complex or shows or describes other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained and each rejected claims specified."

In response, the Examiner provided a scant two sentences, which is as follows:

(C) Appellant argues that the office action is silent to numerous claims. However, all of the claims are met by the prior art.

Examiner's Answer pg. 9

The Examiner's refusal to supply a reasoned rejection is disappointing, to say the least. The Examiner's statement speaks for itself.

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10.   Conclusion

Appellant submits for the reasons set out in both Appellant's Appeal Brief and this Reply Brief, the rejections are improper and that all the claims pending in the present application are allowable over the asserted references. Appellant respectfully requests that the Board of Patent Appeals and Interferences reverse the decision rejecting the pending independent claims 1, 42, and 83, allow all dependents at least by virtue of the allowance of their parent, and subsequently direct the Examiner to pass the case to issue.

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Respectfully submitted,

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_____
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Date: October 8, 2008